

**US EPA Comments on Draft Survey Units Project Reports  
for Survey Units 316, 334, 335, and 336  
Comments dated June 22, 2015**

Thank you for sending the Draft Survey Units Project Reports for Survey Units (SUPRs) 316, 334, 335, and 336, collectively known as Work Package #65, dated May 29, 2015, prepared for the Navy Base Realignment and Closure Program Management Office West by TetraTech EC, Inc.

In addition to the radionuclides of concern, various chemicals of concern, including metals, VOCs, SVOCs, oil and grease, assorted petroleum hydrocarbons, PCBs, PAHs, and pesticides might also be present. However, the chemicals of concern are not discussed in the report and are not included in the report's risk analysis for residual contaminants.

Neither the Radionuclides of Concern (ROCs) nor the release criteria are listed in the report but are referenced in the SUPRs. However, the radionuclides for which the report's risk analysis was performed are  $^{90}\text{Sr}$ ,  $^{137}\text{Cs}$  and  $^{226}\text{Ra}$ . The risk associated with the sum of the average concentrations of the ROCs may not exceed Superfund's nominal risk management range of  $10^{-6}$  to  $10^{-4}$ . Using the current version of EPA Superfund program's PRG (Preliminary Remediation Goals) calculator at [ [HYPERLINK "http://epa-prgs.ornl.gov/radionuclides/"](http://epa-prgs.ornl.gov/radionuclides/) ], the soil concentrations that are associated with a risk of  $10^{-4}$  in the suburban residential land use scenario are as follows:

$^{90}\text{Sr}$	6.63	pCi/gm
$^{137}\text{Cs}$	5.09	pCi/gm
$^{226}\text{Ra}$	0.666	pCi/gm*

\*By previous agreement between U.S. EPA Region 9, the California Department of Toxic Substances Control (DTSC) and the California Department of Public Health (CalDPH), the soil concentration that is associated with a risk of  $10^{-4}$  is taken to be 1.00 pCi/gm above the site's reference area background concentration.

EPA would normally expect the survey results to be subjected to some statistical tests, most notably the Wilcoxon Rank-Sum Test that is described in the *Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM) Revision 1, NUREG-1575 Rev. 1/EPA 402-R-97-016 Rev. 1/DOE EH-0624 Rev.1, dated August 2000. However, because the Navy's contractor states that none of the measurements exceed the release criteria, none of the statistical tests was considered to be necessary and therefore those tests were not performed.

The Navy's risk analysis does not conform to EPA's. Although the Navy's risk analysis is sufficient in this case, below is EPA's risk analysis coefficient with the reported mean soil concentrations to evaluate the risk associated with the survey unit. This estimate of both dose and risk is lower than the Navy's estimate, based on the same average concentrations in the trench unit and backfill.

While formatting changes could make the reports more explicitly address CERCLA measures and help provide the reader with more context, EPA concurs with the Navy's finding that the Survey Units 316, 334, 335, and 336 are suitable for release from institutional controls with respect to radioactive contamination using Superfund criteria. EPA therefore accepts the present version of the four reports.

Below are tables for these Survey Units showing the Navy's contractor's dose and risk estimates using RESRAD and EPA's dose and risk estimates using the PRG's to directly estimate the risk from measured contaminant concentrations.

### Survey Unit 316

The report describes the final status surveys (FSSs) that were conducted in the survey unit following removal of 557 feet of storm drains, sanitary sewers and manholes from 17 trench units in Area 33 of Parcel C, together with fill material that was imported to the site to bring the surface to grade.

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD)		EPA (PRG Calculator)	
		Estimated Dose Rate mrem/yr	Estimated Cancer Risk	Estimated Dose Rate mrem/yr	Estimated Cancer Risk
Backfill					
<sup>90</sup> Sr	0.152	--	--	0.1042	2.293E-06
<sup>137</sup> Cs	0.020	--	--	0.0179	3.929E-07
<sup>226</sup> Ra	-0.141	--	--	0.0000	0.000E+00
<i>Total</i>		0.6518	8.385E-06	0.1221	2.686E-06
Trench Unit					
<sup>90</sup> Sr	0.254	--	--	0.1742	3.831E-06
<sup>137</sup> Cs	0.022	--	--	0.0196	4.322E-07
<sup>226</sup> Ra	-0.422	--	--	0.0000	0.000E+00
<i>Total</i>		1.067	1.364E-05	0.1938	4.263E-06
NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.					
NOTE 2: The PRG Calculator's slope factors use a risk/dose coefficient of 8.46X10 <sup>-7</sup> per mrem as described in Federal Guidance Report No. 13 <i>Cancer Risk Coefficients for Environmental Exposure to Radionuclides</i> EPA 402-R-99-001 dated September 1999.					

## Survey Unit 334

Draft Parcel C Phase II Survey Unit 334 Project Report (DCN: RMAC-0809-0012-0054) dated May 2015. The report was prepared for the U.S. Navy Base Realignment and Closure (BRAC) Program Management Office West by TetraTech EC, Inc., of San Diego. The report describes the final status surveys (FSSs) that were conducted in the survey unit following removal of 441 feet of storm drains, sanitary sewers and manholes from 9 trench units in Area 35 of Parcel C, together with fill material that was imported to the site to bring the surface to grade.

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD)		EPA (PRG Calculator)	
		Estimated Dose Rate mrem/yr	Estimated Cancer Risk	Estimated Dose Rate mrem/yr	Estimated Cancer Risk
Backfill					
<sup>90</sup> Sr	0.149	--	--	0.1022	2.247E-06
<sup>137</sup> Cs	0.021	--	--	0.0188	4.126E-07
<sup>226</sup> Ra	-0.066	--	--	0.0000	0.000E+00
<i>Total</i>		0.4626	5.998E-06	0.1209	2.660E-06
Trench Unit					
<sup>90</sup> Sr	0.058	--	--	0.0398	8.748E-07
<sup>137</sup> Cs	0.025	--	--	0.0223	4.912E-07
<sup>226</sup> Ra	-0.038	--	--	0.0000	0.000E+00
<i>Total</i>		0.2123	2.860E-06	0.0621	1.366E-06
NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.					
NOTE 2: The PRG Calculator's slope factors use a risk/dose coefficient of 8.46X10-7 per mrem as described in Federal Guidance Report No. 13 <i>Cancer Risk Coefficients for Environmental Exposure to Radionuclides</i> EPA 402-R-99-001 dated September 1999.					

## Survey Unit 335

The report describes the final status surveys (FSSs) that were conducted in the survey unit following removal of 453 feet of storm drains, sanitary sewers and manholes from 7 trench units in Area 35 of Parcel C, together with fill material that was imported to the site to bring the surface to grade.

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD)		EPA (PRG Calculator)	
		Estimated Dose Rate mrem/yr	Estimated Cancer Risk	Estimated Dose Rate mrem/yr	Estimated Cancer Risk
Backfill					
<sup>90</sup> Sr	0.152	--	--	0.1042	2.293E-06
<sup>137</sup> Cs	0.020	--	--	0.0179	3.929E-07
<sup>226</sup> Ra	-0.077	--	--	0.0000	0.000E+00
<i>Total</i>		0.4556	5.901E-06	0.1221	2.686E-06
Trench Unit					
<sup>90</sup> Sr	0.069	--	--	0.0473	1.041E-06
<sup>137</sup> Cs	0.025	--	--	0.0223	4.912E-07
<sup>226</sup> Ra	-0.006	--	--	0.0000	0.000E+00
<i>Total</i>		0.2372	3.174E-06	0.0696	1.532E-06
NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.					
NOTE 2: The PRG Calculator's slope factors use a risk/dose coefficient of 8.46X10-7 per mrem as described in Federal Guidance Report No. 13 <i>Cancer Risk Coefficients for Environmental Exposure to Radionuclides</i> EPA 402-R-99-001 dated September 1999.					

## Survey Unit 336

The report describes the final status surveys (FSSs) that were conducted in the survey unit following removal of 526 feet of storm drains, sanitary sewers and manholes from 28 trench units in Area 34 of Parcel C, together with fill material that was imported to the site to bring the surface to grade.

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD)		EPA (PRG Calculator)	
		Estimated Dose Rate mrem/yr	Estimated Cancer Risk	Estimated Dose Rate mrem/yr	Estimated Cancer Risk
Backfill					
<sup>90</sup> Sr	0.154	--	--	0.1056	2.323E-06
<sup>137</sup> Cs	0.020	--	--	0.0179	3.929E-07
<sup>226</sup> Ra	-0.113	--	--	0.0000	0.000E+00
<i>Total</i>		0.527	6.804E-06	0.1235	2.716E-06
Trench Unit					
<sup>90</sup> Sr	0.098	--	--	0.0672	1.478E-06
<sup>137</sup> Cs	0.021	--	--	0.0188	4.126E-07
<sup>226</sup> Ra	0.015	--	--	0.0682	1.500E-06
<i>Total</i>		0.5726	8.227E-06	0.1542	3.391E-06
NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.					
NOTE 2: The PRG Calculator's slope factors use a risk/dose coefficient of 8.46X10 <sup>-7</sup> per mrem as described in Federal Guidance Report No. 13 <i>Cancer Risk Coefficients for Environmental Exposure to Radionuclides</i> EPA 402-R-99-001 dated September 1999.					

Please feel free to contact me any time if you would like to discuss these comments.